

CLAIMS:

5 1. An optical collective substrate of an optically transmissive material having a structure in which incident light from one principal plane side of the substrate is locally collected in each place toward an array of light-utilizable areas formed on the outside of the other principal plane, wherein
the one principal plane is provided with a groove comprising an outline having at least
10 one inclined plane associated with the light-utilizable area, the groove being filled with optically transmissive stuff of a predetermined refractive index, the filled groove portions making bases for allowing the incident light from the one principal plane side to be collected to the respective light-utilizable areas.

15 2. An optical collective substrate as defined in Claim 1, characterized in that the groove extends along at least a part of an edge of the light-utilizable area.

20 3. An optical collective substrate as defined in Claim 1 or 2, characterized in that the one principal plane has planes extending with a substantially equal height in areas other than the groove.

25 4. An optical collective substrate as defined in Claim 1, 2 or 3, characterized in that the optically transmissive stuff has a function of pasting an additional film to the one principal plane.

30 5. A display device using an optical collective substrate as defined in any one of Claims 1-4, comprising a display medium for forming images, which is disposed on the other principal plane side and carried on the optical collective substrate, the display device having pixels or predetermined displayed units corresponding to the light-utilizable areas.

35 6. A display device according to a display device in Claim 5, characterized in that an additional film is pasted to the one principal plane by the optically transmissive stuff.

7. A display device according to Claim 5 or 6, characterized in that the display medium is a liquid crystal medium.

8. A method of manufacturing an optical collective substrate of an optically transmissive material having a structure in which incident light from one principal plane side of the substrate is locally collected in each place toward an array of light-utilizable areas formed on the outside of the other principal plane, comprising:

5 a first step of forming, in the one principal plane, a groove comprising an outline having at least one inclined plane associated with the light-utilizable area; and

a second step of filling the groove with optically transmissive stuff of a predetermined refractive index.

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9. A method as defined in Claim 8, characterized in that the optically transmissive stuff has an adhesive property and the method further comprises a third step of affixing an additional film on the one principal plane using the adhesive property of the optically transmissive stuff.

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10. A method as defined in Claim 8 or 9, characterized in that the second step includes a process of applying the optically transmissive stuff to the one principal plane of the optical collective substrate.

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11. A method as defined in Claim 8, 9 or 10, characterized in that the first step comprises a masking process of covering the one principal plane with a mask having a pattern that causes an area of a groove to be formed to be exposed and causes the other area to be masked and a spraying process of spraying the masked one principal plane of the optical collective substrate with a substance capable of etching the material of the optical collective substrate.

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12. A method as defined in Claim 11, characterized in that in the spraying process a spraying nozzle is used to blast the substance capable of etching, positioned opposed to the area of the groove, and moved along the extending pattern of the area of the groove while spraying the substance capable of etching in a condition that the nozzle is positioned at a center of the area of the groove in a direction traversing a moving direction of the nozzle.

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13. A method of manufacturing a display device using an optical collective substrate of an optically transmissive material having a structure in which incident light from

one principal plane side of the substrate is locally collected in each place toward an array of light-utilizable areas formed on the outside of the other principal plane, wherein:

the one principal plane is provided with a groove comprising an outline having at least one inclined plane associated with the light-utilizable area, the groove being filled with

5 optically transmissive stuff of a predetermined refractive index, the filled groove portions making bases for allowing the incident light from the one principal plane side to be collected to the respective light-utilizable areas,

the method of manufacturing comprising:

a step of forming such a display mechanism construction including a display medium
10 for forming an image on the other principal plane side of the optical collective substrate that the construction has pixels or predetermined displayed units corresponding to the light-utilizable areas.

14. A method according to Claim 13, further comprising a step of pasting an
15 additional film to the one principal plane of the optical collective substrate, wherein an adhesive property of the optically transmissive stuff makes adhesion of the additional film.